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DISCUSSION

CARL H. PARKER, M. D. (65 North Madison Avenue, Pasadena)—Doctor Pindell has done well to emphasize the importance of cavity formation in tuberculosis and the great value of the x-ray in the diagnosis of these cavities.

It is indeed fortunate that the procedure of artificial pneumothorax, together with x-ray studies, at once proves that a cavity exists and at the same time acts as the best sort of treatment of the condition. When a shadow is seen in the roentgenogram of a tuberculous patient which has the appearance of a cavity, it seems to me to be a logical procedure to introduce air into the pleural cavity, early in the progress of the process, rather than to wait for the uncertain physical signs of the thickened walls of a long-standing lesion. If this is done I believe that the healing of cavities will be much more often accomplished than it has been in the past and that the individual patients will be saved a long and trying invalidism.

As roentgenologists we should certainly be on the alert to recognize cavities at the earliest possible moment, because of their importance to the patient.

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CHARLES G. SUTHERLAND, M. D. (Mayo Clinic, Rochester, Minnesota)—As Doctor Pindell's paper suggests, there is a three-way chance of error in the diagnosis of tuberculous cavities; they may be overlooked or mistaken for other lesions, and other lesions and conditions may be mistaken for cavities. The cavity which lies in an area of consolidation or which is completely filled at the moment of examination is scarcely demonstrable. Small cavities and newly formed cavities which are often of irregular shape and without definite walls, easily escape observation. Multiple grouped cavities can be confounded with bronchiectasis as Doctor Pindell has said. Although strong arguments have been advanced to the contrary, present opinion inclines to the view that the so-called "subpleural pneumothoraces" are really cavities, as a rule. When diagnosis is attempted on a single film, it is often easy to visualize an apparent cavity by mistaking vascular markings, scar tissue, or a portion of a rib for the wall of a cavity, and the illusion is heightened if the included area is emphysematous and bright.

In the main, cavitation is a feature of advanced tuberculosis, and while cavities may occur relatively early and their discovery is important, it is still more important that the tuberculosis itself be diagnosed, whether cavities are demonstrable or not.

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H. S. HUNSBERGER, M. D. (870 Market Street, San Francisco)—Positive x-ray proof of lung cavities requires their demonstration as circular shadows in both the anterior and lateral projections. Less positive evidence is a stereoscopic image suggesting cavity in the anterior projection. An annular shadow plus a fluid level is practically conclusive evidence of cavity. Very many cavities are not susceptible of such positive demonstration. Cavities at the apices or in the upper part of the upper lobes cannot easily be shown in the lateral view; but annular shadows that might be considered pleural rings or localized pneumothoraces—and are sometimes so considered—can also be demonstrated in carefully taken lateral views in so many instances as to raise the question whether all annular shadows should not be considered cavities until proven otherwise. It is probable that they should.

Doctor Pindell has done a service by calling attention to the frequency of silent cavities. It sometimes happens that large annular shadows are shown in both views, demonstrating large cavities to the satisfaction of the roentgenologist, when there are absolutely no discoverable clinical signs. The clinician is sometimes inclined to doubt the presence of these cavities. In such cases the roentgenologist should stand his ground, fortified by the statements of Doctor Pindell and the autopsy statistics he has quoted from the Fitzsimmons General Hospital.

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DOCTOR PINDELL (closing)—I have used the lateral view in demonstrating cavities, as suggested by Doctor Hunsberger, and found it to be of value, but, as he has stated, "For cavities at the apices and in the upper part of the upper lobes, this position is not applicable." Therefore I consider the oblique views better when in doubt, as the greater percentage of cavities are in these regions.

Doctor Sutherland's point is well taken, when he says, "That on a single film we are likely to mistake vascular markings, scar tissue or the attachments of the anterior ribs for cavities." I usually avoid this error, for I seldom diagnose tuberculous cavities except by the stereoscope.

He also mentions "that, while the diagnosis of cavities is important, it is still more important that the tuberculosis itself should be diagnosed, whether cavities are demonstrable or not." This, of course, we all know is true, but my paper deals entirely with the diagnosis of tuberculous cavities and not with the diagnosis of tuberculosis.

In my stressing the importance of the early diagnosis of tuberculous cavities Doctor Parker has brought out one of the big points that I had in mind when he mentions artificial pneumothorax and its indications. All of us who are in large sanatoriums know that this is a recognized procedure, and it should be done early.

POSTURAL DEFECTS—CORRECTABLE IN SCHOOL PHYSICAL EDUCATION CLASSES*

By WILLIAM ARTHUR CLARK, M. D.
Pasadena

DISCUSSION *by Harold H. Hitchcock, M. D., Oakland; Steele F. Stewart, M. D., Los Angeles; C. L. Lowman, M. D., Los Angeles.*

THE necessity for corrective classes in physical education is readily seen when one examines the statistics of findings in large series of cases where routine physical examinations have been made of great numbers of children or young men and women as in universities, large school systems, and in recruits for military service. Such statistics show a certain percentage of any large group to be abnormal in one or more aspects of body mechanics. In some series this percentage is surprisingly large.

It might be suggested that statistics include all the very slight deviations from the normal which are of no consequence except perhaps from the minor viewpoint of cosmetics. In answer to this argument, it can only be said that the danger to health and well-being is a potential one and that whatever measures are adopted to correct even the slightest defect, are justified if they bring the individual to the fullest possible physical capacity

* Summary of a talk given by the author before the physical education teachers of the Pasadena schools.

and as near to perfection as training and perseverance can make him or her.

The question arises: What is normal in a child or youth? Certainly normality is not a sharply defined more or less arbitrary ideal to which everyone must conform or be condemned as abnormal. Types must be recognized and given due consideration. Some boys and girls are of the Antiole type, others are the Clydesdale type. One may be just as healthy, mentally and physically, as the other. Two trees of the same kind may differ widely in contour, yet we would not think of referring to either of them as abnormal. One boy may show a deviation from what is considered as normal posture but due to good compensatory muscle strength, show no ill effects, while another boy with the same degree of deviation may not compensate in the same way and sooner or later show the effects in ill health.

VICIOUS CIRCLE IN POSTURE

There is a vicious circle in posture which has many links. Starting with the link which has to do with the structural framework of the body, we have: (1) slump in the skeleton; (2) interference with organs; (3) poor physiologic function; (4) malnutrition and poor aeration; (5) depressed muscle tone which causes (1) slump in skeleton, etc. It is difficult perhaps in each individual case to tell where the circle started, but it may be attacked and a link broken anywhere. The links with which the physical education teacher have to deal are mostly those of depressed muscle tone and slump in the skeleton.

We must not think of the human body as a structure balanced stably as is a steel building or tower. Its line of gravity or weight-bearing does not pass through the dead center of any joint. In the spine, which is a long series of joints, the line goes through the promontory of the sacrum and the anterior part of the lumbar curve, but does not touch the vertebrae again except in the cervical region. If it were not for muscles and ligaments, the joints would bend under the weight and the entire structure would crumple. Those muscles which counteract this tendency to crumple must necessarily be the strongest.

One of the most delicately balanced joints is the hip. It has been likened by Todd to the hub of a bicycle wheel, the spokes of which are represented by the surrounding muscles. Both the intra- and the extrapelvic muscles maintain the equilibrium of the pelvis on the hips. Interference with any one group breaks the equilibrium. The pelvis is then tilted forward, carrying with it, of course, the sacrum, often to such extent that the sacrum lies completely horizontal instead of nearly perpendicular. When such condition exists a severe lordosis compensates for this extreme forward curve, and an exaggerated dorsal curve which pushes the head and shoulders forward. Many round shoulders may have their real cause in a tilted pelvis. It is certain that round shoulders are rarely seen without the extreme lordosis that goes with the tilted pelvis.

THE HUMAN SPINE COMPARED WITH THAT OF QUADRUPEDS

Lovett makes an instructive comparison of the human spine with that of quadrupeds. It must be remembered that the former differs in anatomic structure very little from the latter; but that they differ in several respects in the mechanics of function. The quadruped spine carries the weight of the trunk somewhat as the supporting structure of a bridge carries its load, the line of force being at right angle to the spine, while the human spine supports the body in a line of force nearly parallel to itself. The front limbs in the quadruped act as supporting structures, but in the human they are merely weights which must be supported by the spine. Chest breathing in quadrupeds is aided by gravity; while in the human frame the ribs must be raised against gravity.

In evolving from the horizontal to the upright position there have been, necessarily, many changes in stress of ligaments and muscles and one is inclined to believe that the evolution is still incomplete, judging from the number of backache cases which we all see and which seem to be due to overstrained muscles. The junction of the spine with the pelvis seems to be the weak spot in the mechanics of the upright position. Possibly in the distant future this joint may become completely ankylosed so that a relaxed sacro-iliac joint and backaches will be an unknown affliction.

DEVIATIONS IN THE ANTEROPOSTERIOR PLANE

Considered without reference to the concomitant disturbances of equilibrium farther down, round shoulders consists in a forward and downward slump of the scapula and entire pectoral girdle, and in an abnormally exaggerated dorsal curvature of the spine, especially in the upper dorsal region. The child is usually low in muscle tone; and in cases originating in habit, low also in will power. The heart and diaphragm are, to a certain degree, suspended from the root of the neck, and if this point of support is persistently low these organs tend to lose tone and suffer from impairment of function. If the entire weight of the clothing is carried on shoulder straps which pass over the outer part of the shoulders, the growing child will have an added difficulty in keeping the shoulders up. Lovett suggests that instead of this method all the clothing below the waist should hang from the belt line, leaving the shoulders unweighted. Goldthwait emphasizes the effect of bad design in school furniture in causing the child to assume a bent attitude at the desk and a slumped position in the chair. The chair should have a shallow seat which will prevent the inclination to slide forward and to buckle the spine in the middle. The shallow seat also provides for both long and short leg individuals as, in the former, the thighs can incline downward readily, and in the latter the individual can sit back in the chair with equal comfort.

As this condition is one of the most prevalent postural defects in school children, it is practicable to treat them in classes. Supporting braces

are generally inadvisable because they tend to weaken the muscles, but they may be found necessary in those cases where passive manipulation is being done, to be worn part of the time to maintain what has been gained by the manipulation.

There is a form of round shoulders which may have its inception in a developmental defect of the vertebrae rather than in muscular weakness. While the vertebrae cannot be said to be diseased, there has been perhaps a delay in ossification in the anterior part of the discs which has resulted in irregularity in shape and thickness of the vertebral bodies anteriorly situated. This causes a backward curve which may be more or less fixed. Such a condition should be suspected in cases which resist passive correction.

Lordosis and abdominal ptosis go together as a rule, and are observed usually in children who are round shouldered. The relaxed abdominal muscles become stretched to unusual length and lose their tone. While it may be necessary in patients well past the youthful years to put on an abdominal belt, in the school girl, the best remedy is development of the rectus muscles by systematic exercises carried out daily. Extreme cases of lordosis may develop into spondylolisthesis in which there is a definite forward displacement of the fifth lumbar vertebra over the sacrum. It should be suspected in people who have very deep depression in the lower lumbar region and who have persistent backache which resists all the usual remedies for relief.

LATERAL DEVIATIONS

So far we have spoken of deviations in the anteroposterior plane. Of the less frequent lateral deviations scoliosis is the most common form. This may be functional, structural or paralytic. The functional type can often be helped by such exercises as the school gymnasium can furnish. Most of these patients are girls, and the curve is to the right in a majority of instances. Many causes have been suggested for the development of lateral curvature of the spine. Perhaps the one heard most frequently is the position of the child at the school desk. This would explain the preponderance of right-side curves since most people are right-handed and sit with the right shoulder higher in writing. It does not explain, however, why more girls than boys are affected.

Another cause which has occurred to me recently, is the posture during sleep. If one lies on the side with a pillow under the head and shoulders, the spine naturally curves down in the lower dorsal region merely by the force of gravity. In girls, the pelvis being wider, this downward curve would be more pronounced than in boys. If true, this would explain the preponderance of girls who suffer from this deformity. Also if it is found that all those who have a right lateral curve are in the habit of sleeping on the right side with a pillow, then the right side majority would be explained. So far the number of cases observed and questioned has not been of sufficient number to verify the theory; but those who have been questioned admit sleeping usually on the right side and have right-sided curves. Much more time is spent in sleep than is spent in sitting at a school desk or in any other one posture, which suggests that the sleep theory is more plausible than the desk theory.

A functional curve, if allowed to persist, may become a structural scoliosis. It is obvious that the best time to treat such a deformity is in its earliest stages before the bones have taken on a contour which fits in with the changed condition.

The diagnosis of scoliosis can be made by carefully observing the child from directly behind. The clothes should be removed down to the hips except that a narrow apron may be hung down in front so that it does not cover the shoulders. The arms should hang relaxed. Severe or even moderate cases can be recognized at a glance. The very mild forms will require more careful analysis. It should be noted whether the shoulders are on the same level and whether one scapula is higher or more prominent than the other. The curves between the ribs and hips should then be compared, one side with the other. The iliocostal angle may be deeper or more acute on one side and more or less flattened out on the other. In cases where one leg is longer than the other, the hip is, of course, actually higher on the side of the long leg and the iliocostal angle is also exaggerated. Measurement of the legs should be done in all cases. The patient is then asked to bend forward until the back is horizontal, head down, arms hanging relaxed. A curve to the right will then show up as an elevation of the right side above that of the left. This is due to rotation of the spine, carrying with it the entire chest.

Scoliosis cases cannot well be treated in groups or postural classes but should have individual attention. Each case is a problem in itself, and unless two identical cases should be found, special exercises suited to each case will be required. The structural cases will, of course, need more than exercises, as it is necessary to overcorrect and to hold them in the overcorrected position in the hope of changing the shape of the bones and the contour of the chest. Paralytic scoliosis requires that the spine be supported, since a paralyzed muscle has little chance of improvement if kept constantly on a stretch. Exercises in these patients are to be done with caution in order that the paralyzed muscles may not be overworked and yet have sufficient use to develop the power that remains.

Torticollis, or wry neck, in its mildest form, can be helped by supervised exercises supplemented by massage and passive motion. The majority of such cases are due to muscle contracture which can be stretched out if not of too long duration. The unsightly asymmetrical appearance of the face with one eye higher than the other, which is noticed in torticollis of long standing, can be avoided if the condition is recognized and treated in the beginning. Even though the twisted head and wry neck can be straightened by cutting the

tendon, the face can never be changed if the deformity has not been corrected in childhood.

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DISCUSSION

HAROLD H. HITCHCOCK, M. D. (1906 Franklin Street, Oakland)—Doctor Clark has pointed out some of the fundamentals necessary for the correction of postural defects in school children. The correction of these defects I feel should be the first thing accomplished in the departments of physical education. After the fundamentals of correct posture have been mastered, exercises done by students to maintain correct posture will be of much greater benefit. It is indeed discouraging to see students go through compulsory exercises maintaining an entirely incorrect body mechanics.

Doctor Clark has clearly pointed out what is important, and it would be gratifying to see more students coming out of high schools with these details corrected. Examinations of college students do not show this to be the case.

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STEELE F. STEWART, M. D. (817 Westlake Professional Building, Los Angeles)—Doctor Clark in giving a résumé of the theories of posture has failed to mention probably the two most important factors involved in the production of posture: namely, heredity and fashion.

At the present time there is no way to influence heredity, and fashion is based on personal vagaries that put it beyond systematic help. I feel that the whole subject of posture is being overemphasized, and especially is this true when it is turned over to the physical education department of the public schools. It is a rather remarkable fact that self-confidence varies in inverse proportion to knowledge, and the blasé way in which the subject of posture is taken by the average physical education graduate and teacher I fear reflects largely ignorance. It is my personal opinion that it is a waste of time and public money to carry on any corrective physical education in the public schools. The problems involved in any particular case are so complicated that specialized knowledge is required for proper understanding and solution, and hence corrective treatment should only be given under the direction and care of a competent physician.

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CHARLES LE ROY LOWMAN, M. D. (2417 South Hope Street, Los Angeles)—To persons having extensive experience in the examination of school children of all ages the force of Doctor Clark's comments will meet with significant approval. Medical men have assumed an attitude of indifference toward postural deviations, believing that they are hereditary and will be outgrown, and because certain cases of bow-legs and shoulder girdle deviations in childhood are adjusted after a few years, take for granted that readjustment always occurs. If this were true why should large groups examined at the universities, and similarly in the army, show a very high percentage having postural deviations exactly like those in childhood? The findings and percentages of postural defects in these adult groups have been found to be almost identical with those in the grades. This is, I think, definite evidence that most deviations are not outgrown.

Various authorities give percentages of from fifty to eighty, of school children with some postural deviation. It can readily be seen that there are not enough interested medical or orthopedic men to train this enormous number of individuals. Consequently the school health and corrective departments must bear the brunt of this preventive work. It is well known that many physical directors are not specially trained in corrective work, but the impetus of the last few years has given a good deal of very definite education to many supervising physical directors who are carrying on excellent work in this line. The schools of Pasadena for years have carried on a uniform and consistent line of corrective work. I have been well informed that the corrective department of their high schools contains more individuals who are recent arrivals in Pasadena than it does resident Pasadena children who have passed through the grades, showing that the work of the last five years, even where it is done on a group basis, as it is in their elementary schools, is effective.

The most essential factor in this work is, of course, the necessity of impressing upon directors and examiners just which children may be handled by the physical education department. The orthopedic referees in the Los Angeles schools are doing very effective work along this line in weeding out the cases which are too severe to be handled by the directors, as well as those that are pathological. It is the aim of these departments to handle only simple postural cases which should respond definitely to health and exercise work.

The largest group of deviations are those found in the shoulder girdle and in the feet and legs. In young children these deviations comprise as high as 80 and 90 per cent, and in the high school group 65 to 70 per cent. Physical education activities should be modified to meet the needs of the majority. Activities can be definitely corrective without being labeled as such. For instance, swimming is a corrective procedure which can be used for certain types of cases, such as shoulder girdle deviations and round shoulders. Certain strokes can be definitely corrective and still not lose any recreative value. Vicious effects of running and jumping can be neutralized by proper attention to shoeing and by giving enough other gymnastic exercises to counteract such effects. Throughout the whole chain of activities a careful analysis of activities will show that this same idea can be carried out to good advantage.

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DOCTOR CLARK (closing)—I wish to thank Doctors Hitchcock, Stewart, and Lowman for their discussion of this paper. Of course, as Doctor Hitchcock suggests, the problem of body mechanics should be intelligently met. The formation of habits in the child are most important in this connection.

I am glad to have Doctor Stewart's frank criticism and feel that such is essential regarding any problem which may be overemphasized as it serves as a balance wheel in our activities.

Much of the work in the Pasadena schools had its start under the guidance of Doctor Lowman, who is still helpful with advice regarding all these problems. His comments above are therefore most valuable.

ON COUNCILMANIA LAFLEURI*

By RAWSON J. PICKARD, M. D.
San Diego

DISCUSSION *by T. H. T. Wight, M. D., Palo Alto; Herbert Gunn, M. D., San Francisco; John V. Barrow, M. D., Los Angeles.*

SIX years have passed since Kofoid and Swezy published their report describing *Councilmania lafleuri,* an ameba parasitic in the human intestine,[1] where it has been found to be as common as the infection with *Entameba coli.* During this time in spite of the importance of the discovery both scientifically and clinically, that is, as regards both exactness of observation and the art of medicine, there has been but little notice of this ameba. Wenyon denied the specific existence of *Councilmania,* claiming that most of the budding cysts were artefacts, and while his paper was answered[2] he does not appear to have given the matter any further consideration, although in his "Protozoölogy" he gives a description of it as an "aber-

* Read before the Pathology and Bacteriology Section, California Medical Association, at the Fifty-Sixth Annual Session, April 25-28, 1927.